

WHAT IS CLAIMED IS:

1. A method for the detection, identification and/or the quantification of one or more target molecule(s) present in a sample comprising the steps of :
 - 5 - binding said target molecule to a capture molecule bound upon the surface of a solid support, said solid support being a disc comprising registered data, said binding resulting in a signal,
 - detecting and/or quantifying said signal with the proviso
10 that said signal is not obtained through cleavage of the capture molecule.
2. The method according to claim 1, wherein the signal for the detection, identification and/or quantification of the target molecule is present or read on
15 areas of the disc different from areas wherein the registered data are present or read.
3. The method according to claim 2, wherein the signal for the detection, identification and/or quantification of the target molecule is present or read on
20 an area being on one side of the disc, and wherein the signal of the registered data is present or read on an area being on the opposite side of the said disc.
4. The method according to claim 1, wherein the detection, identification and/or quantification is performed
25 on areas of the disc comprising registered data.
5. The method according to claim 1, wherein the capture molecules are bound on determined locations on the disc surface according to an array having a density of at least 5 different bound capture molecules/cm² disc surface.
- 30 6. The method according to claim 1, comprising the detection, identification and/or quantification of expression of multiple genes.

7. The method according to claim 5, wherein the detection, identification and/or quantification are performed on at least 3 different arrays present upon the same disc surface.

5 8. The method according to claim 1, further comprising the step of reading and/or recording the registered data by a reader other than the detector used for the detection, identification and/or quantification of the signal resulting from the binding between the target
10 molecule(s).

9. The method according to claim 1, wherein the capture molecules and the target molecules are nucleotide sequences.

10. The method according to claim 1, wherein
15 the capture molecules and target molecules are respectively either antigens and antibodies or antibodies and antigens.

11. The method according to claim 1, wherein the capture and target molecules are respectively either receptors and ligands of said receptors or ligands and their
20 receptors.

12. The method according to claim 1, wherein the capture molecule is a single or double stranded nucleotide sequence and wherein the target molecule is a ligand of said sequence.

25 13. The method according to claim 1, wherein the target molecules comprise two binding sites, one binding site to its corresponding capture molecule and another binding site for another molecule.

14. The method according to claim 13, wherein
30 said target molecule is an enzyme.

15. The method according to claim 1, wherein the capture molecules are obtained from a chemical or biological library.

16. The method according to claim 1, wherein the capture molecules are bound to the surface of the disc and are in solution in one or more wells of multiwell plates disposed upon said surface, said solution being withdrawn and
5 delivered on the surface in defined locations.

17. The method according to claim 5, wherein the detection of the signal allows for characterization of a chemical compound bound to its corresponding capture molecule at a determined location as a potential drug acting upon a
10 receptor being its capture molecule.

18. The method according to claim 4, wherein the detection of the signal allows for characterization of a chemical compound bound at a determined location to a receptor as a potential drug.

15 19. The method according to claim 5, wherein the detection of the signal allows for characterization of a chemical compound which acts as agonist or antagonist of the fixation of a ligand to its receptor.

20 20. The method according to claim 5, wherein the signal observed in a determined location is correlated with the identification and/or a quantification of said target compounds.

21. The method according to claim 1, wherein the detection and/or the quantification of the signal is
25 obtained by reflection, absorption or diffraction of a light beam, or variation of an electromagnetic field.

22. The method according to claim 1, wherein the detection and/or the quantification of the signal is made on a turning disc.

30 23. The method according to claim 1, wherein the detection and/or the quantification of the signal is obtained by a fluorescent light emission after excitation of the bound target and capture molecules by a light beam.

24. The method according to claim 1, wherein the detection and/or the quantification of the signal is obtained by an emission selected from the group consisting of a light beam, a radiation emission, and a magnetic field.

5 25. The method according to claim 24, wherein the emission of a light beam is generated by a marker bound to the target and/or the capture molecule, said marker being selected from the group consisting of chemical, biological, fluorescent, electroluminescent and radioactive markers.

10 26. The method according to claim 1, wherein the signal generated by the binding between the target and the capture molecules is either a precipitate on the surface of the disc or a corrosion of one or more layer(s) of the surface of the disc.

15 27. The method according to claim 26, wherein the precipitate is either an opaque precipitate or a magnetic precipitate.

 28. The method according to claim 26, wherein the precipitate is a deposit of a colloidal metal reagent.

20 29. The method according to claim 26, wherein the precipitate is a silver precipitate.

 30. The method according to claim 1, wherein the binding between the target and the capture molecules allows the binding of one or more additional molecule(s) upon
25 the target and/or the capture molecules.

 31. The method according to claim 30, wherein said additional molecule is either a microbead or a magnetic particle.

30 32. The method according to claim 1, wherein the registered data of the disc are binary data.

 33. The method according to claim 1, wherein the disc is a compact-disc.

34. The method according to claim 7, wherein reading registered data allows for the interpretation of the signal resulting from the binding between the capture and the target molecules.

5 35. The method according to claim 1, wherein reading of the registered data provides information regarding the location of the deposit of capture molecules upon the disc surface.

10 36. The method according to claim 2, wherein the disc has at least one portion containing a layer for writing numeric information.

15 37. The method according to claim 2, wherein the result data of identification and/or quantification of the bound target molecule are written on the disc as numeric data.

 38. The method according to claim 2, wherein resulting data of identification and/or quantification of the bound target molecules are transformed into numeric data.

20 39. The method according to claim 2, wherein capture molecules are specific molecules corresponding to a limited number of data bytes.

 40. The method according to the claim 39, wherein the capture molecules serve as target molecules.

25 41. The method according to claim 1, wherein numeric information are bytes converted into a nucleotide sequence(s) being deposited and/or present on the disc.

30 42. The method according to the claim 39, wherein the alignment of capture molecules is converted into information selected from the group consisting of words, numbers, music, software, and data.

 43. The method according to claim 39, comprising data bytes present on the same disc as both numeric information and capture molecules.

44. The method according to claim 1, which further comprises the step of putting into fluid contact one or more chambers located upon the surface of the disc by connecting them by micro-channels and valves.

5 45. A disc comprising registered data, and bound upon its surface, one or more non-cleavable capture molecule(s) which allow for binding with one or more target molecule(s) to be detected, identified and/or quantified.

10 46. The disc according to claim 45, wherein the non-cleavable capture molecules and/or the target molecules are selected from the group consisting of nucleotide sequences, antigens, antibodies, receptors, ligands of receptors, receptor and enzyme peptides, lipids, saccharides, haptens, fluorophores, chromophores, catalysts, and new
15 macromolecules obtained by combinatorial chemistry, or a combination thereof.

 47. The disc according to claim 45, wherein the registered data of the disc are binary data.

20 48. The disc according to claim 45, wherein the registered data are grooved binary data.

 49. The disc according to claim 45, which is a compact-disc.

25 50. The disc according to claim 45, which comprises microchannels and chambers which are connected and in fluidic contact by said microchannels.

 51. The disc according to claim 45, wherein the capture molecules are bound upon the disc surface in locations being separated from areas comprising readable registered data.

30 52. The disc according to claim 45, wherein the registered data contain information regarding the location of the samples and/or the capture molecules on the disc surface.

53. The disc according to claim 45, wherein the capture molecules on the disc surface are a library of molecules.

5 54. The disc according to claim 45, wherein the capture molecules are bound upon one side of said disc, and wherein the opposite side of said disc comprises the registered data.

55. The disc according to claim 45, wherein the capture molecules are disposed on the surface of the disc as
10 arrays of at least 5 spots per cm²/surface.

56. The disc according to claim 45, comprising at least 3 arrays for the analysis of at least 3 samples.

57. The disc according to claim 45, which comprises on its surface a polymer layer with aldehyde groups
15 for a covalent binding of the capture molecules.

58. The disc according to claim 45, which comprises on its surface a polymer layer with acrylate groups for a covalent binding of the capture molecules.

59. The disc according to claim 45, which
20 comprises a polymer layer which has been oxidized prior to the binding of the capture molecules.

60. The disc according to claim 45, which comprises at least at some specific locations upon its surface one or more non-fluorescent layers.

25 61. The disc according to claim 45, comprising a central portion being a mini-CD.

62. The disc according to claim 45, which comprises one portion containing a layer for writing numeric information.

30 63. The disc according to claim 51, wherein said portion is a writing mini-CD.

64. The disc according to claim 63, wherein said portion comprises data regarding location, detection, identification and/or quantification of a bound target molecule, said data being stored on the disc surface as
5 numeric data.

65. The disc according to claim 45 wherein the capture molecules are specific and correspond to data bytes.

66. The disc according to claim 65, wherein the
10 data bytes corresponding to capture molecules are present in line on the disc surface.

67. The disc according to claim 66, wherein the alignment of capture molecules is converted into digital information selected from the group consisting of words,
15 numbers, music, software and data bases.

68. The disc according to claim 65, which comprises data bytes present on the same CD as both numeric and capture molecules.

69. The disc according to claim 45, which
20 comprises molded support in contact with the disc, wherein said support divides the disc into incubation chambers

70. A method of making the disc according to claim 45, which comprises the step of binding upon the surface of a disc comprising registered data, non-cleavable
25 capture molecules through a photoactivation of said capture molecules.

71. The method according to claim 70, wherein the binding of the non-cleavable capture molecules is obtained through a covalent link between an extremity of the
30 capture molecule and the surface layer of the disc.

72. The method according to claim 70, wherein the disc surface is recovered by a protective layer, which allows or improves the protection and stabilization of the

non-cleavable capture molecule and/or the protection, stabilization and/or detection of the binding between the target molecule and its non-cleavable capture molecule.

73. A diagnostic kit comprising the disc of the
5 claim 45 and reactants allowing the binding between a target molecule and its capture molecule and possibly reactants allowing the detection of a signal which results from said binding.

74. A detection and/or reading device which
10 allows the detection and/or the quantification of a signal which results from the binding between a target molecule present in a sample and its capture molecule, and which comprises the disc according to claim 45 and means for the detection and/or quantification of said signal.

75. The detection and/or reading device
15 according to claim 74, being a compact-disc reading device.

76. The detection and/or reading device
according to claim 74, which comprises a first reading head for the reading of registered data and a second reading head
20 for the detection and/or the quantification of the signal which results from the binding between target molecule and its capture molecule.

77. The detection and/or reading device
according to claim 74, comprising a disc reading means, and
25 two separate detectors, the first detector for reading and/or following the registered data and the second detector for detecting and/or quantifying the signal resulting from the binding of the target molecule and the capture molecule.

78. The device according to claim 77, wherein
30 the second detector further comprises means for emitting a laser beam and a light photomultiplier system.

79. The device according to claim 74, which
comprises means for performing a lateral movement and a

circular movement of the disc or the detector, the combination of said two movements allowing the scanning of the surface of the disc wherein the capture molecules were bound to the target molecules to be detected and/or
5 quantified.

80. The device according to claim 74, which comprises means for lateral movement and circular movement of the disc or the detection(s), the combination of said two movements allowing the scanning of the surface of the disc
10 wherein non-cleavable capture molecules where bound to target molecules to be detected and/or quantified.

81. A handling device for the disc according to claim 45 comprising means and media for purification of the target molecule, retro-transcription of said target molecule
15 being a RNA sequence into a DNA sequence, a specific cleavage of said target molecule, or a genetic amplification of said target molecule.

82. The handling device according to claim 81, wherein said means comprises several chambers connected to
20 each other by microchannels and valves.

83. The handling device according to claim 82, wherein one or more of said valves are opened by using centrifugal force of the turning disc or are opened by melting a closing material present in said valves or
25 microchannels, either by application of a local heated material or air or by steady illumination of a laser beam upon said material.

84. The handling device according to claim 81, further comprising a heating system.

30 85. An apparatus for performing the method according to claim 44, comprising a handling device for a disc platform and a supporting contact with the surface of the disc allowing the formation of a series of chambers

connected by microchannels upon the array, said chambers comprising capture molecules.

86. A diagnostic kit according to claim 73 further comprising reactants allowing the detection of a
5 signal which results from said binding.